

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An uplink transmitting device in a mobile communication system, comprising:

an encoder for receiving ~~an~~ a first information bit stream and for outputting three streams, ~~one of an~~ a second information bit stream, ~~one of~~ a first parity stream, and ~~one of~~ a second parity stream, by encoding the first information bit stream;

an interleaver for interleaving the encoded streams by a predetermined interleaving rule;

a radio frame segmenter for receiving the interleaved stream from the interleaver and mapping the received interleaved stream onto at least one consecutive radio frame;

a demultiplexer for separating each of the at least one radio frames received from the radio frame segmenter ~~back into said three streams~~ a third information bit stream, and first and second parity streams from the demultiplexer; and

a rate matcher for bypassing the third information bit stream and for puncturing a part of the first and second parity streams from the demultiplexer according to a given rate matching rule.

2. (Currently Amended) The transmitting device of claim 1, wherein the interleaved ~~information bit stream~~ is mapped onto consecutive radio frames when a ~~the~~ transmission time interval (TTI) ~~of the information bit stream~~ is longer than 10 ms.

3. (Currently Amended) The transmitting device of claim 1, wherein the transmission time interval (TTI) ~~of the information bit stream~~ is one of 10, 20, 40, and 80ms.

4. (Previously Presented) The transmitting device of claim 1, wherein the interleaving rule is a bit reverse method.

5. (Currently Amended) The transmitting device of claim 1, wherein an arrangement of ~~the information bits symbols and the parity bits symbols~~ in each of the at least one radio frames has a regular pattern.

6. (Cancelled)

7. (Currently Amended) The transmitting device of claim 2, wherein the consecutive radio frames have initial bits ~~symbols~~ determined by ~~the~~ a TTI.

8. (Currently Amended) The transmitting device of claim 5, wherein the demultiplexer separates bits ~~symbols~~ of the radio frame into the third information bit stream, and the first and second parity streams from the demultiplexer ~~three streams~~ according to the regular pattern ~~corresponding to the radio frame~~.

9. (Currently Amended) The transmitting device of claim 8, further comprising:
a memory for storing initial symbols of the consecutive radio frames; and
a controller for controlling the demultiplexer according to the regular pattern and the stored initial bits ~~symbols~~ of the at least one radio frames.

10. (Previously Presented) The transmitting device of claim 9, further comprising:
a multiplexer for multiplexing the outputs of the rate matcher under a control of the controller.

11. (Currently Amended) The transmitting device of claim 1, wherein the interleaver interleaving the encoded streams at a TTI (Transmission Time Interval) after inserting filler bits into the encoded streams in order to equalize a size of the at least one radio frames.

12. (Currently Amended) The transmitting device of claim 1, wherein the rate matcher comprises:

- a first component rate matcher for rate-matching the information bits ~~symbols~~;
- a second component rate matcher for rate-matching the first parity bits ~~symbols~~; and
- a third component rate matcher for rate-matching the second parity bits ~~symbols~~.

13. (Currently Amended) A transmitting device in a mobile communication system, comprising:

an encoder for receiving an information bit stream transmitted at a predetermined transmission time interval (TTI) and for outputting the information bit stream and at least one type of parity stream by encoding the information bit stream in accordance with a coding rate of said encoder;

an interleaver for receiving the information bit stream and the at least one type of parity stream from the encoder, for interleaving the information bit stream and the at least one type of parity stream and for outputting interleaved stream ;

a radio frame segmenter for receiving the interleaved stream from the interleaver, for dividing the received stream into radio frames, and for outputting the radio frames in sequence;

a demultiplexer for receiving the radio frames and for demultiplexing the received radio frames back into the information bit stream and the at least one type of parity stream; and

a rate matcher for rate matching the streams received from the demultiplexer and outputting rate matched streams, said rate matcher having at least one component rate matcher for rate matching a part of the parity stream, a number of the at least one component rate matcher being equal to a number of the parity streams,

wherein the demultiplexer switches each of the parity bits ~~symbols~~ in the radio frames to said at least one component rate matcher corresponding to each of the parity bits ~~symbols~~.

14. (Previously Presented) The transmitter device of claim 16, wherein the regular pattern is determined by the TTI.

15. (Previously Presented) The transmitter device of claim 14, wherein the regular pattern is further determined by the coding rate.

16. (Currently Amended) The transmitter device of claim 13, wherein bits ~~symbols~~ of the radio frame are separated to the at least one component rate matcher corresponding to each type of parity stream in accordance with a regular pattern for arranging information bits ~~symbols~~ and parity bits ~~symbols~~ in each radio frame.

17. (Previously Presented) The transmitter device of claim 13, further comprising:

a multiplexer for multiplexing the rate matched streams by switching outputs of the at least one component rate matcher.

18. (Previously Presented) The transmitter device of claim 17, further comprising:
a controller for controlling the switching of the demultiplexer and the multiplexer based on at least one of the TTI and the length of each of the radio frames.

19. (Cancelled)

20. (Previously Presented) The transmitter device of claim 13, wherein a length of each of the radio frames is 10ms.

21. (Original) The transmitter device of claim 13, wherein the TTI is one of 10, 20, 40 and 80 ms.

22. (Original) The transmitter device of claim 13, wherein the coding rate is $1/3$.

23-24. (Cancelled)

25. (Previously Presented) The transmitter device of claim 16, further comprising a memory for storing the regular pattern including an initial symbol corresponding to each of the radio frames.

26. (Original) The transmitter device of claim 13, wherein the encoder is a turbo encoder.

27. (Currently Amended) A method of transmitting in a mobile communication system, the method comprising the steps of:

receiving an information bit stream transmitted at a predetermined transmission time interval (TTI);

encoding the information bit stream and outputting the encoded information bit stream and at least one type of parity stream corresponding to the information bit stream, a number of the parity streams corresponding to a coding rate of an encoder;

interleaving the information bit stream and the parity stream and outputting the interleaved stream;

dividing the interleaved stream into at least one radio frame and outputting the at least one radio frame, each of the at least one radio frame having a predetermined time frame;

demultiplexing the received radio frame back into the information bit stream and at least one type of parity stream; and

rate matching the demultiplexed streams by a rate matcher;

wherein ~~each parity symbol~~ bits in the radio frame are is switched to a component rate matcher corresponding to each of the at least one parity stream, said component rate matcher having at least one parity component rate matcher for rate matching a part of said at least one parity stream, a number of the at least one parity component rate matcher being equal to a number of the at least one parity stream.

28. (Previously Presented) The method of claim 30, wherein the regular pattern is determined by the TTI.

29. (Previously Presented) The method of claim 28, wherein the regular pattern is further determined by the coding rate.

30. (Currently Amended) The method of claim 27, wherein symbols of the at least one radio frame are separated to the component rate matcher by the demultiplexer in accordance with a regular pattern for arranging information bits ~~symbols~~ and parity bits ~~symbols~~ in each radio frame.

31. (Previously Presented) The method of claim 27, further comprising the step of:

multiplexing the rate matched streams by synchronizing the multiplexing with the demultiplexing by switching to the corresponding component rate matcher.

32. (Previously Presented) The method of claim 27, wherein the predetermined length of the radio frame is 10ms.

33. (Original) The method of claim 27, wherein the TTI is one of 10, 20, 40 and 80 ms.

34. (Original) The method of claim 27, wherein the coding rate is 1/3.

35-36. (Cancelled)

37. (Currently Amended) A transmitting device in a mobile communication system, comprising:

an encoder for receiving an information bit stream transmitted at a predetermined transmission time interval (TTI) and for outputting the information bit stream and at least one kind of parity stream corresponding to the information bit stream in accordance with a coding rate of said encoder;

an interleaver for receiving the information bit stream and the parity stream from the encoder, for interleaving the information bit stream and the parity stream, and for outputting an interleaved stream;

a demultiplexer for receiving the interleaved stream and for demultiplexing the received interleaved stream back into the information bit stream and the at least one kind of parity stream; and

a rate matcher for rate matching the information bit stream and the at least one kind of parity stream received from the demultiplexer, wherein said rate matcher includes at least one component rate matcher for rate matching a part of the at least one kind of parity stream, and a number of the component rate matcher is equal to a number of the at least one kind of parity stream,

wherein the demultiplexer switches ~~each bits symbol~~ in the interleaved stream to the component rate matcher corresponding to each of the at least one kind of parity stream.

38. (Currently Amended) The transmitter device of claim 37, wherein the demultiplexer switches each of the ~~bits symbols~~ of the interleaved stream to the at least one component rate

matcher in accordance with a regular pattern for arranging information ~~bits symbols~~ and parity ~~bits symbols~~ in the interleaved stream.

39-40. (Cancelled)

41. (Previously Presented) The transmitter device of claim 38, wherein the regular pattern is determined by the TTI.

42. (Currently Amended) The transmitter device of claim 38, further comprising:
a multiplexer for synchronously multiplexing the output ~~bits symbols~~ of the at least one component rate matcher by synchronizing with the demultiplexer.

43. (Previously Presented) The transmitter device of claim 42, further comprising:
a controller for controlling the demultiplexer and the multiplexer based on the regular pattern.

44. (Cancelled)

45. (Previously Presented) The transmitter device of claim 37, wherein a length of at least one of the information bit stream and the interleaved stream is 10ms.

46. (Original) The transmitter device of claim 37, wherein the TTI is one of 10, 20, 40 and 80 ms.

47. (Original) The transmitter device of claim 37, wherein the coding rate is $1/3$.

48. (Cancelled)

49. (Previously Presented) The transmitter device of claim 41, further comprising:
a memory for storing the regular pattern including an initial symbol corresponding to the interleaved stream.

50. (Original) The transmitter device of claim 37, wherein the encoder is a turbo encoder.

51. (Currently Amended) A method of transmitting in a mobile communication system, the method comprising the steps of:

receiving an information bit stream at a predetermined transmission time interval (TTI);

encoding the information bit stream and outputting the encoded information bit stream and at least one kind of parity stream corresponding to the information bit stream in accordance with a coding rate of a encoder;

interleaving the information bit stream and the parity stream and outputting an interleaved stream;

demultiplexing the interleaved stream back into the information bit stream and the at least one kind of parity stream; and

rate matching the demultiplexed streams by a rate matcher, said rate matcher including at least one component rate matcher for rate matching a part of said at least one kind of parity stream;

wherein ~~each parity symbol~~ bits in the interleaved stream are switched to at least one parity component rate matcher corresponding to each of the at least one kind of parity stream, a number of the at least one parity component rate matcher being equal to a number of the at least one parity stream.

52. (Previously Presented) The method of claim 53, wherein the regular pattern is determined by the TTI.

53. (Currently Amended) The method of claim 51 ~~50~~, wherein the bits ~~symbols~~ of the interleaved stream are separated in accordance with a regular pattern for arranging information bits ~~symbols~~ and parity bits ~~symbols~~ in the interleaved stream.

54. (Cancelled)

55. (Currently Amended) The method of claim 51, further comprising the step of:

multiplexing the output ~~bits~~ symbols of the rate matching step by synchronizing the multiplexing with the demultiplexing by switching in the rate matcher.

56. (Previously Presented) The method of claim 51, wherein a length of at least one of the information bit stream and the interleaved stream is 10ms.

57. (Original) The method of claim 51, wherein the TTI is one of 10, 20, 40 and 80 ms.

58. (Original) The method of claim 51, wherein the coding rate is $1/3$.

59-60. (Cancelled)

61. (New) A mobile communication system, comprising:

an encoder for receiving an information bit stream and for outputting three encoder output streams, an information bit stream, a first parity stream, and a second parity stream, by encoding the information bit stream;

an interleaver coupled to the encoder for performing an interleaving operation according to a predetermined interleaving rule;

a radio frame segmenter for receiving an interleaved stream from the interleaver and mapping the interleaved stream onto at least one radio frame;

a demultiplexer for separating the at least one radio frame received from the radio frame segmenter into three demultiplexer output streams; and

a rate matcher for bypassing an information bit stream from the demultiplexer and for puncturing a part of a first and second parity streams from the demultiplexer according to a given rate matching rule.

62. (New) The system of claim 61, wherein the interleaved stream is mapped onto consecutive radio frames when a transmission time interval (TTI) is longer than 10 ms.

63. (New) The system of claim 61, wherein the interleaver performs the interleaving operation at a TTI (Transmission Time Interval), after inserting filler bits into an output of the encoder, in order to equalize a size of the at least one radio frames.

64. (New) The system of claim 61, wherein the rate matcher comprises:

- a first component rate matcher for rate-matching the information bit stream from the demultiplexer;

- a second component rate matcher for rate-matching the first parity stream from the demultiplexer; and

- a third component rate matcher for rate-matching the second parity stream from the demultiplexer.

65. (New) A method for transmitting data in a mobile communication system, the method comprising:

- encoding an information bit stream corresponding to a coding rate of an encoder and outputting the information bit stream, a first parity stream, and a second parity stream;

- performing an interleaving operation with an interleaver coupled to the encoder;

- mapping an interleaved stream from the interleaver onto at least one radio frame and outputting the at least one radio frame;

- performing a demultiplexing operation with a demultiplexer and outputting an information bit stream of the demultiplexer, and a first parity stream of the demultiplexer, and a second parity stream of the demultiplexer; and

- bypassing the information bit stream of the demultiplexer and puncturing a part of the first and second parity stream from the demultiplexer according to a given rate matching rule.

66. (New) The method of claim 65, wherein the interleaved stream is mapped onto consecutive radio frames when a transmission time interval (TTI) is longer than 10 ms.

67. (New) The method of claim 65, wherein the interleaving operation is performed at a TTI (Transmission Time Interval), after inserting filler bits into an output of the encoder, in order to equalize a size of the at least one radio frame.

68. (New) A mobile communication system, comprising:

means for receiving an information bit stream and for outputting an output stream including an information bit stream, a first parity stream, and a second parity stream, by encoding the information bit stream;

means for performing an interleaving operation in response to the output stream and outputting an interleaved stream;

means for creating at least one radio frame in response to the interleaved stream;

means for separating the at least one radio frame into a separate information bit stream, a first separate parity stream, and a second separate parity stream; and

means for bypassing the separate information bit stream and for puncturing a part of the first and second separate parity streams according to a given rate matching rule.

69. (New) The system of claim 68, wherein the interleaved stream is mapped onto consecutive radio frames when a transmission time interval (TTI) is longer than 10 ms.

70. (New) The system of claim 68, wherein the interleaving operation is performed at a TTI (Transmission Time Interval), after inserting filler bits into the output stream, in order to equalize a size of the at least one radio frame.